

REMARKS

Of claims 3, 4, 6-14 and 16 currently in this application, claims 4, 8, 10-12 and 16 have been cancelled and claims 3, 6, 7, 9, and 13 have been amended to more clearly define this invention. Reconsideration of this application in review of this response is respectfully requested.

The Examiner has presumed that the subject matter of the various claims was commonly owned at the time that any inventions were made. This presumption is correct.

Claim 16 stands rejected under 35 USC §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicants regard is the invention. Examiner states that terms "higher" and "lower" render this claim as indefinite. As this claim has been cancelled, it is believed that this rejection is moot.

Claims 3 and 4 stand rejected under 35 USC §103 (a) as unpatentable over Lipshutz et al in view of Parsons et al. The Examiner believes that Parsons teaches an absorbent material coupled to the outlet of a channel which is used to draw fluid through the channel. The Examiner also contends that extending the absorbent member into the channel of Parsons would provide the shape claimed by the applicants, as the extension would be obvious to one of ordinary skill in the art, as this person would recognize that the absorbent member could be placed anywhere within the channel to draw fluid through it. This would provide an absorbent member in which the member itself and its shape is used to control the fluid flow.

Amended claim 3 now requires an absorbent material having a triangular shape which creates an expanding moving fluid across the triangular absorbent material as the fluid contacts the material, thus increasing the driving force within the

microfluidic channel as fluid moves through the channel. This it not the case with Lipshutz or Parsons. Parsons does teach a triangular channel in front of the absorbent material that is used to provide a decreased liquid flow rate per unit area of liquid path along this second path (col. 6, lines 49-51). However, the change in size of this channel means that the channel in Parsons is no longer a microfluidic channel. Amended claim 3 is directed to a microfluidic channel and a structure to increase the driving force within the microfluidic channel. The purpose of the invention in claim 3 is to increase the driving force within the microfluidic channel without changing the channel. This is accomplished by the addition of a triangular absorbent material placed in contact with the outlet of the microfluidic channel. This structure is neither taught nor suggested in either Lipshutz or Parsons, taken alone or in combination. The force of the fluid in the channel in Parsons is changed by changing the structure of the channel, while there is no discussion in Lipshutz about changing the driving force within the microfluidic channel. Thus, it is submitted that amended claim 3 is not rendered obvious by the combination of these two prior art references.

Claims 6 – 12 stand rejected under 35 USC § 103 (a) over Yager in view of Lipshutz. Amended claim 6 now requires a gravitational force and a first passageway having a first dimension along the reservoir sized such that fluid driven by gravitational force overcomes any surface tension of the fluid and flows into the reservoir in a smooth continuous stream. When using gravity as a driving force, the surface tension of the fluid will cause the fluid to form drops when entering the reservoir, causing an uneven flow. If the passageway is sized to have a dimension along the reservoir to overcome the surface tension, the fluid will flow into the reservoir as a smooth continuous stream. Neither Yager nor Lipshutz discusses a device which uses gravitational forces to drive the fluid through the device, as now claimed. In addition, neither of the Yager nor Lipshutz references describe a device with the requirement of a passageway having a dimension sized to overcome surface tension from the fluid flowing

through the passageway. Neither of the reference devices address surface tension at all.

Claim 7 has been amended to positively claim a window for viewing the fluids within the detection channel and a template containing indicia representation of second fluid concentration within the detection channel. It is submitted that neither the Yager nor Lipshutz references, either taken alone or combined, teach this feature of the present invention. Yager teaches viewports for viewing the flow channel at different points with a fluorescence microscope or with a photo detector. To determine the concentration of the second fluid within the detection channel, Yager would have to know which colors represent which concentrations, or refer to something else. The template of claim 7 contains indicia representative of different concentrations, so the user merely looks through the window to observe a reaction, and compares that position within the channel to the indicia on the template to determine the correct concentration. This is much more efficient than using the Yager device. Yager describes the procedure for determining the concentration in col. 13, lines 34-47. This is a very complex system, as compared to the present invention. Thus, it is submitted that claim 7 is not obvious in view of the cited references.

Amended claim 9 now requires a gravitational force, a first reservoir, a first channel, a second reservoir, a second channel, a main microfluidic channel having an inlet coupling region having a greater width than the main channel such that liquid entering a reservoir from one outlet opening flows into the main microfluidic channel without trapping an air bubble within the other channel and blocking the outlet opening of the other channel.

The examiner contends that any coupling region which allows the joining of two entry channels while still allowing the contents of these two entry channels while still allowing the contents of these two channels to flow down to main channel meets this limitation. However, Yager and Lipshutz are silent as to the driving

force in the devices taught therein. When operating the channel structure under the force of gravity, the problem of trapping an air bubble in one of the channels often arises. When the device is constructed according to claim 9, the problem does not occur. Therefore, it is submitted that amended claim 9 is not obvious in view of the cited references.

Claim 13 and 14 stand rejected under 35 USC § 103 (a) over Yager and Lipshutz in view of Kellogg. As these claims substantially depend from claim 9, they should be patentable if claim 9 is patentable.

Also enclosed is a Petition for a Two Month Extension of Time. The Examiner is requested to charge Deposit Acct. No. 12-1677 for a fee of \$205, as this application is owned by a small entity.

As no claims were added to this application, it is believed that no additional fees are due.

For the reasons given above, it is believed that all claims now contained in this application are in condition for allowance, and such favorable action are respectfully requested.

Respectfully submitted,

I hereby certify that this correspondence is being forwarded with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on March 24, 2003.

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